

CLAIMS

What is claimed is:

1. An extrudable composition comprising:
  - 5 (a) thermoplastic resin;
  - (b) reinforcing agent comprising cellulose;
  - (c) oxidized polyethylene;
  - (d) ester wax; and
  - 10 (e) amide wax.
2. The extrudable composition of claim 1 wherein said thermoplastic resin comprises polyvinyl chloride (PVC) resin.
3. The extrudable composition of claim 1 wherein said amide wax  
15 comprises bisamide wax.
4. The extrudable composition of claim 1 wherein the combination of (c ),  
(d) and (e) components is present in an amount effective to reduce the  
apparent viscosity of said extrudable composition relative to the  
20 same composition in the substantial absence of said combination  
of (c), (d), and (e) components.
5. An extrudate product prepared from the composition of claim 4  
having a tensile strength that is not substantially less than the  
25 tensile strength of an extrudate product prepared from  
substantially the same composition but lacking a combination of  
(c), (d) and (e) components in a substantial amount.

6. An extrudate product prepared from the composition of claim 4 having a flexural strength that is not substantially less than the flexural strength of an extrudate product prepared from substantially the same composition but lacking a combination of (c), (d) and (e) components in a substantial amount.
7. The extrudable composition of claim 1 comprising from about 0.1 PHR to about 3.6 PHR amide wax, from about 0.025 PHR to about 3 PHR oxidized polyethylene wax, and from about 0.1 PHR to about 3.6 PHR ester wax.
8. The extrudable composition of claim 1 comprising from about 0.1 PHR to about 2.1 PHR amide wax, from about 0.1 PHR to about 3 PHR oxidized polyethylene wax, and from about 0.2 PHR to about 2.0 PHR ester wax.
9. The extrudable composition of any one of claims 1 to 4 wherein said oxidized polyethylene comprises a major proportion of oxidized polyethylene having an acid number of from about 7 to about 20 mg KOH/g and a viscosity of from about 8,500 to about 85,000 cP at 150° C.
10. The extrudable composition of any one of claims 1 to 4 wherein the oxidized polyethylene component has an acid number of from about 10 to about 20 mg KOH/g and a viscosity of from about 200 cps to about 1,000 cps at 140° C.
11. The composition of any one of claims 1 to 4 wherein the ester wax has an acid number of from about 10 to about 14 mg KOH/g and a viscosity of 50 cSt at 240° F.

12. The extrudable composition of any one of claims 1 to 4 wherein the amide wax has an acid number of from about 5 to about 9 mg KOH/g and a melting point of about 280° F.
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13. The extrudable composition of any of claims 1 to 4 wherein said combination of components (c), (d) and (e) together comprise from about 0.5 PHR to about 6 PHR.
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14. The composition of any of claims 1 to 4 wherein said combination of components (c), (d) and (e) together comprise from about 1.0 PHR to about 5.5 PHR.
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15. The extrudable composition of claim 4 wherein said components (c), (d) and (e) together are present in an amount effective to improve one or more extrudability characteristics relative to the same composition but lacking said combination of components (c), (d) and (e), said one or more improved extrudability characteristics being selected from the group consisting of:
- 20
- a) decreased extrusion pressure for a given die and extrusion rate;
  - b) reduced amount of stabilizer needed to achieve the same degree of stability;
  - c) reduced extruder head pressure for a given die and
  - 25
  - d) reduced extrusion torque for a given die and extrusion rate;
  - e) reduced equilibrium temperature;
  - f) reduced fusion torque;
  - g) increased surface gloss of an extrudate product prepared
  - 30
  - from said extrudable composition; and

h) increased dimensional stability of an extrudate product prepared from said extrudable composition.

16. The extrudable composition of claim 4 wherein said combination of components (c), (d) and (e) together are present in an amount effective to improve one or more characteristics of an extrudate product prepared from said extrudable composition relative to the same composition but lacking said combination of components (c), (d) and (e), said one or more improved characteristics being selected from the group consisting of:
- a) increased surface gloss;
  - b) increased flexural strength; and
  - c) increased tensile strength.
17. An extruded product made from an extrudable composition in accordance with claim 16 wherein the extruded product has an increased tensile strength relative to an extruded product prepared from the same extrudable composition but lacking any substantial amount of said combination of components (c), (d) and (e).
18. The extruded product of claim 17 wherein said increase in tensile strength is an increase of at least about 2 percent.
19. An extruded product made from an extrudable composition in accordance with claim 16 wherein the extruded product exhibits an increase in flexural strength relative to an extruded product prepared from the same extrudable composition but lacking any substantial amount of said combination of components (c), (d) and (e).
20. The extruded product of claim 19 wherein said increase in flexural strength is an increase of at least about 2 percent.

21. The extrudable composition of claim 16 wherein at least one of said effected extrudability characteristic is improved by at least about 5 percent.

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22. A lubricant composition comprising:

(a) from about 30 wt. % to about 50 wt. % of amide wax;

(b) from about 10 wt. % to about 40 wt. % of oxidized polyethylene wax; and

10 (c) from about 30 wt. % to about 50 wt. % of ester wax.

23. The lubricant composition of claim 22 comprising:

(a) from about 35 wt. % to about 50 wt. % of one or more bis-amide waxes;

15 (b) from about 15 wt. % to about 25 wt. % of one or more oxidized polyethylene waxes; and

(c) from about 35 wt. % to about 50 wt. % of one or more ester waxes.

20 24. The lubricant composition of any of claims 22 and 23 wherein said oxidized polyethylene comprises at least a major proportion of oxidized polyethylene having a Brookfield viscosity of at least about 6000 cps at 140 °C.

25 25. The lubricant composition of any of claims 22 to 23 wherein the ester wax is selected from the group consisting of penta-erythritol-adipate-stearate, penta-erythritol-adipate-oleate, penta-erythritol-tetrastearate, penta-erythritol-monostearate, and penta-erythritol distearate, and mixtures of any two or more thereof.

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26. The lubricant composition of any of claims 22 or 23 wherein the amide wax is selected from the group consisting of ethylenediamine distearamide, eurucamide, oleoamide-stearamide, and mixtures of any two or more thereof.
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27. An extrudable composition comprising PVC resin, reinforcing agent and the lubricant composition according to any one of claims 22 to 23, said lubricant composition being present in the extrudable composition in an amount sufficient to permit the extrudable composition to be
- 10 stable at a heat stabilizer content of less than about 2 PHR.
28. The extrudable composition of claim 27 wherein said lubricant composition is present in an amount sufficient to permit the extrudable composition to be stable, as measured by torque rheometry, at a heat
- 15 stabilizer content of less than about 1.7 PHR.
29. The extrudable composition of claim 27 wherein said lubricant composition is present in an amount sufficient to promote wetting of the reinforcing agent, as measured with respect to the smooth
- 20 appearance of an extrudate formed from the composition.
30. The extrudable composition of claim 29 wherein said lubricant composition is present in an amount sufficient to promote wetting of the reinforcing agent as measured by an increase in the tensile and/or
- 25 flexural strength of an article formed from the composition.
31. The lubricant composition of claim 22 present in an extrudable composition comprising: PVC resin; from about 30 PHR to about 200 PHR cellulose fiber; from about 1.0 PHR to about 5.5 PHR of said
- 30 lubricant composition; from about 0.5 PHR to about 1.5 PHR of at least one paraffin wax constituent; from about 1 PHR to about 10 PHR

of a calcium carbonate constituent; from about 0.8 PHR to about 1.8 PHR of a tin stabilizer constituent; from about 0.5 PHR to about 7.0 PHR of at least one processing aid; from about 0.4 PHR to about 1.5 PHR of a calcium stearate constituent; optionally, up to about 10 PHR  
5 of an impact modifier; and optionally, up to about 0.5 PHR of a polyethylene homopolymer wax constituent.

32. The lubricant composition of any of claims 22 to 24 wherein the oxidized polyethylene wax has an acid number of from about 7 mg  
10 KOH/g to about 20 mg KOH/g and a viscosity of from about 8,500 cps at 150° C to about 85,000 cps at 150° C.

33. A process for preparing an extrudate product comprising providing the extrudable composition of any of claims 1 to 4 and extruding said  
15 extrudable composition.

34. A process for preparing an extrudate product comprising:  
(a) providing an extrudable composition comprising: at least  
one reinforcing agent; at least one resin characterized  
20 in that it undergoes plastic flow; oxidized polyethylene wax; ester wax; and amide wax; and  
(b) extruding said extrudable composition.

35. The process of claim 34 wherein said reinforcing agent comprises  
25 cellulose reinforcing agent and said resin comprise PVC resin.